

**Oroville Facilities Relicensing Efforts
Draft Narrative Reports for PM&E Discussion**

Resource Action: EWG-70

Task Force Recommendation Category: 2

**CONTROL AND/OR ELIMINATION OF NOXIOUS PLANTS IN THE LOW FLOW
SECTION OF THE FEATHER RIVER**

Description of Potential Resource Action:

This Resource Action involves the eradication and/or control of noxious plant species along the Low Flow section of the Feather River and to replant/restore with appropriate native plants. The species of greatest concern are scarlet wisteria (*Sesbania punicea*), giant reed (*Arundo donax*), tree of heaven (*Ailanthus altissima*), and purple loosestrife (*Lythrum salicaria*). Other non-native species of concern found along the low flow reach include pampas grass (*Cortaderia selloana*), fig (*Ficus carica*), and Himalayan blackberry (*Rubus discolor*).

Control methods will include a combination of mechanical, manual, and chemical efforts. Most species will need multiple-year treatments and monitoring. It is expected that treatments will be more intense in the first year and will lessen in both labor and chemical costs in each preceding year.

There are two parts to this Resource Action: 1) control of noxious weed species and 2) restoration with native plants. A number of additional Resource Actions (EWG 73, 74A, 74B, 75, & 76) address the removal and control of noxious weed species and replanting with native species in the Oroville Wildlife Area (OWA), Thermalito Complex, and around Lake Oroville. Resource Actions that address riparian restoration (without the noxious weed component) in the Low Flow section of the Feather River include EWG 51, 61, and 77.

- EWG73: proposes to control noxious weed species in the Thermalito Complex (this mainly addresses purple loosestrife)
- EWG 74A: proposes to control noxious weed species and to replant with native species in the OWA
- EWG 74B: proposes to control noxious weed species and to replant with native species around Lake Oroville
- EWG 75: proposes to control the spread of noxious plant species in the OWA by developing management protocols, including replanting with native species
- EWG 76: proposes to control noxious plant species in the OWA by altering the hydrologic regime to one that would support and protect native riparian vegetation (this addresses the primrose problem in the D Area)

- EWG-51 – Enhance riparian vegetation and trees along the banks of the Low Flow Channel for increased habitat complexity

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- EWG-61 – develop a hydrologic flow regime to support natural regeneration of riparian plant species along the Feather River
- EWG-77 – Enhance or add riparian habitat for threatened and endangered terrestrial plant and animal species in the Low Flow Channel

Nexus to Project:

Managed flows in the Low Flow Reach of the Feather River promote the proliferation of non-native noxious weed species along the banks and in the adjacent floodplain. The lack of periodic flushing flows promotes non-native species encroachment into riparian/wetland habitats and inhibits native riparian/wetland species from establishing. These species may then be dispersed into downstream waters.

Potential Environmental Benefits:

Control of noxious weed species and replacement with native plant species would enhance native vegetation and its associated wildlife. Eradication and/or control of these species in the low flow section of the Feather River will help to reduce the number of seeds and/or plant parts that are flushed downstream and invade other sensitive resources and habitats.

Potential Constraints:

- The presence of threatened or endangered species and/or critical habitat
- Timing of treatments that coincide with restrictions that may be identified during USFWS or NOAA consultations
- This reach of the Feather River is mostly outside the Project Area. Portions of the OWA that do not fall within the Project Area and are managed by the Department of Fish and Game also occur within the low-flow channel. The remainder of the channel is under the Feather River Recreation and Park District and private ownership. The majority of occurrences of the target species do occur below the ordinary high water mark.

Existing Conditions in the Proposed Resource Action Implementation Area:

Noxious weed species occur along the low flow section of the Feather River. These species were mapped during 2002 and 2003. The species identified as those of greatest concern are scarlet wisteria, purple loosestrife, giant reed, and tree of heaven.

Scarlet wisteria (*Sesbania punicea*) is a deciduous riparian shrub or small tree that forms solid stands along riverbanks, displacing native vegetation and wildlife habitat. Each plant produces numerous seeds, which can travel downstream. All parts of the plant, particularly the seeds, are poisonous to mammals, birds, and reptiles. This

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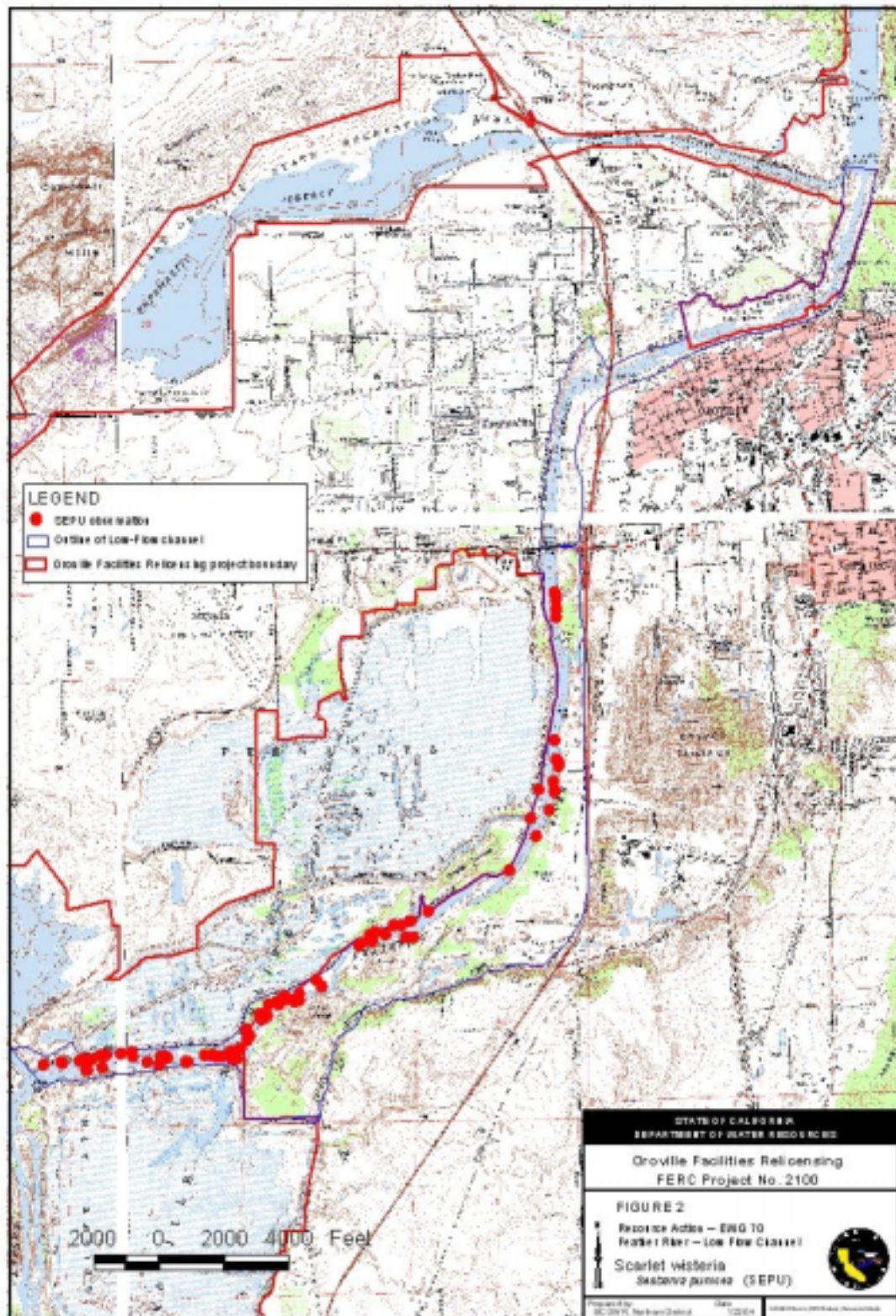
species has only recently been recognized as a species that is rapidly invading riparian vegetation in the Sacramento/San Joaquin River Delta and along rivers leading into the Delta. The OWA and the Feather River are thought to be a source of seeds for the downstream invasion by some agencies/organizations that work in the Delta. Portions of the gravel bars along the Feather River in the low-flow channel have extensive linear stands of scarlet wisteria along the waters edge (Figures 1). These all occur below the Hwy 162 Bridge (Figure 2). Although this species is known to occur as a planted ornamental in a few areas around Oroville, it is not known to be common upstream around Lake Oroville or its tributaries. Thus eradication efforts in the low flow reach are likely to be more effective than for a species with a large upstream seed source. No eradication efforts to date have been attempted in this area.

Figure 1. Scarlet wisteria along the low-flow channel of the Feather River.



Control methods include pulling young plants by hand or with a weed wrench. Larger trees can be cut and the stumps treated with an herbicide. Three biocontrol agents are used against scarlet wisteria in South Africa, but no information is available for California (The Nature Conservancy Website 2002; pers. comm. Fallscheer 2002).

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Purple loosestrife (*Lythrum salicaria*) is a perennial herb that is a common invader of wetland habitats including stream and river banks, edges of ponds, lakes, and reservoirs, flooded areas, and ditches (Bossard 2000). It replaces native plant species and forms dense stands that are unsuitable as cover, food, or nesting sites for a wide range of native animal species. Each plant can produce up to two million seeds which are long-lived and are shed gradually from capsules through the winter, contributing to a large seed bank (Figure 3). This species is part of a state-wide eradication effort by the California Department of Food and Agriculture and other interested agencies/organizations.

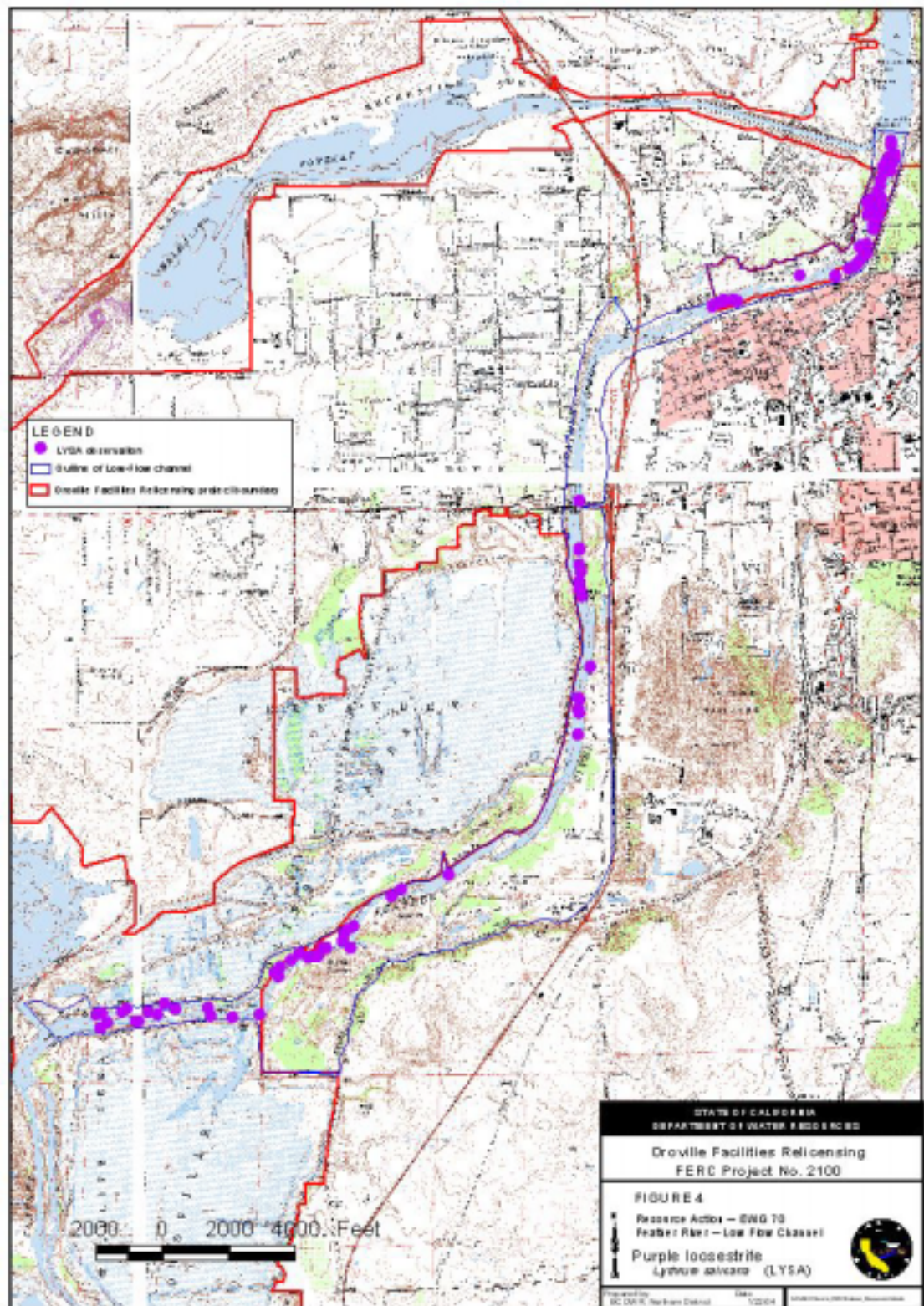
Figure 3. Purple loosestrife in flower



In the low-flow channel, concentrations of purple loosestrife are highest below the Hwy 162 Bridge (Figure 4). In July 2002, with funds provided by SB 1740, the Department of Fish and Game spot sprayed purple loosestrife by boat along both sides of the Feather River from the Hwy 162 Bridge south to the end of the OWA (pers. comm. B. Stone 2003). No official pre- or post-monitoring has been conducted to rate the effectiveness of the application.

Control methods for purple loosestrife usually depend upon the age and size of the infestation. All methods require appropriate timing and follow-up control and monitoring. Physical control (hand pulling) can be used in areas with small stands. Glyphosate (Rodeo/Roundup) is the most common herbicide used to control purple loosestrife. It is approved for use in aquatic environments. However, glyphosate is a non-selective herbicide that kills all vegetation, including surrounding native vegetation that is critical in the recolonization of the site. Application by hand sprayers can be used to decrease the impact to surrounding vegetation.

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Giant reed (*Arundo donax*) is one of the fastest growing land plants in the world and uses vast amounts of water (Figure 5). This combined rate of growth and vegetative reproduction enables it to quickly invade new areas. Once established, it can outcompete and suppress native vegetation. It is highly flammable during most of the year and resprouts aggressively after fire. It provides neither food nor habitat for native wildlife species, nor does it provide significant shading of bank-edge riverine habitats (Team Arundo del Norte Website 2003). The stems and leaves contain several toxic or unpalatable chemicals which probably protect it from herbivory and insect predation.

Figure 5. Giant reed along the Low Flow channel of the Feather River



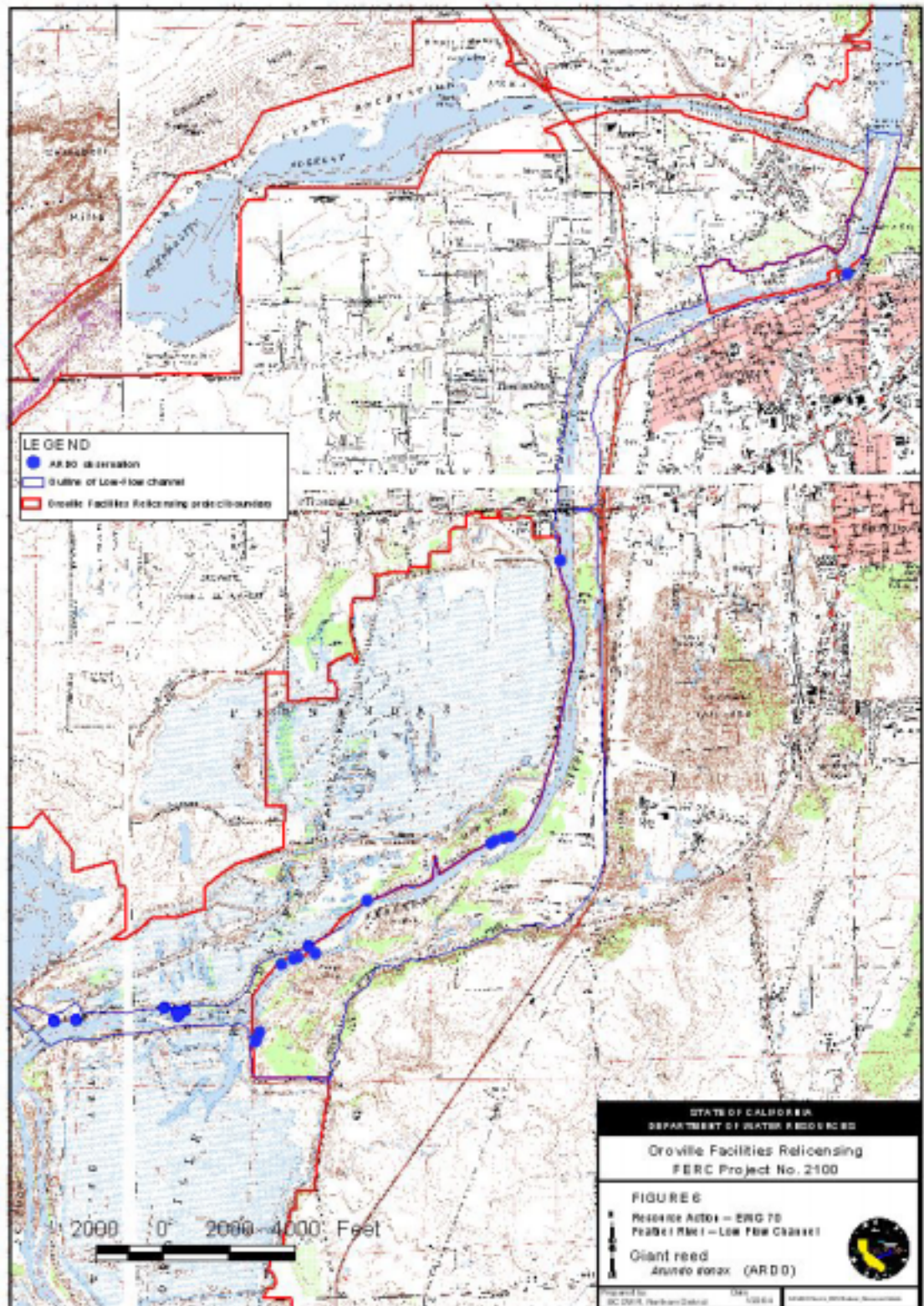
In northern California, invasion of giant reed is relatively recent and less severe than other regions. In southern California, it sometimes occupies entire river channels from bank to bank, covering tens of thousands of acres (Bell 1997). Giant reed is spreading in northern California and several large areas of solid or near-solid stands do exist. Giant reed occurs throughout the OWA and is concentrated mainly below the Hwy 162 Bridge along the low-flow channel of the Feather River (Figure 6).

Control of giant reed usually involves more than one method and is dependent on the size of the infestation. All methods require follow-up control and monitoring. Manual control involves cutting the stems above the base and removing the biomass. Plants can also be dug up to remove the roots. This method disturbs the soil and may help cause erosion. Roots that were missed or cut can also sprout or be carried downstream. The chemical glyphosate (Roundup® or Rodeo®) is the most commonly used herbicide on giant reed. This systemic herbicide is absorbed by plant leaves and stems and is transported to the plant's root system where it kills the entire plant. According to Bell (1997), application is most effective during mid-August to early November when the plants are actively translocating nutrients to the rootmass in preparation for winter dormancy. In taller or large stands of giant reed, one approach is to cut the stalks and remove the biomass, wait three to six weeks for the plants to grow and then apply a foliar spray of herbicide. This requires less

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herbicide and has less chance of overspray onto associated native plant species. This approach may require more follow up applications. Another effective herbicide application involves cutting the stalks and applying undiluted glyphosate directly to the stump. Little is known about the use of various pathogens and insects on the growth and reproduction of giant reed in California. The USDA has not approved any biological control agents for use against giant reed in California.

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